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**DISTRIBUTION OF THE AMERICAN BISON IN PENNSYLVANIA, WITH
REMARKS ON A NEW FOSSIL SPECIES.**

BY SAMUEL N. RHOADS.

Pennsylvania enjoys the distinction of being the scene of the most easterly range of the buffalo, *Bison bison*, in North America. Dr. J. A. Allen, whose excellent memoir on the American Bisons furnishes the best data on this subject, has conclusively proved its existence up to the beginning of this century as far east as Buffalo Valley, near Lewisburg, in Union County. The last buffalo killed in that region was shot by Col. John Kelly, "about 1790 or 1800," on the McClister farm adjoining his own, and situate in Kelly township, about five miles from Lewisburg. Col. Kelly stated that an old Indian named Logan informed him of the former abundance of buffaloes in this valley. In the map of its distribution, Dr. Allen practically limits the range of the buffalo in the Keystone State to the country drained by the Alleghany and Monongahela rivers, which includes the region west of the Alleghany ridge on the south, and on the north, from a point in Clearfield county to the eastern shore of Lake Erie, westward. The movement east of this area is supposed to have been limited to the mountain passes extending along the west branch of the Susquehanna, to the forks below Lewisburg.

Prof. Baird mentions, in the Patent Office Report of 1851, the existence of bones of this species in Pennsylvania caves and alluvial deposits. Dr. Allen took the pains to search for the reported remains taken by Prof. Baird in caves near Carlisle, but was unable to find them, and on inquiry the Professor wrote Dr. Allen that a re-examination would be necessary in order to determine whether they are of the bison, and if so of which species. The uncertainty of the matter justly led Dr. Allen to ignore it and make the Lewisburg record stand as the most easterly authenticated one for North America. In 1873 Dr. Joseph Leidy described and figured¹ the

¹ Contrib. Ext. Vert. Fauna. Washington Terr., p. 255, pl. XXVIII.

second upper molar of a bison found at Pittston, Luzerne Co., Pennsylvania, in association with the remains of the mastodon and fossil horse. This he identified as belonging to the extinct *Bison latifrons*. Dr. Allen¹ contends that this tooth not only lacks the accessory column characteristic of the genus *Bison* but "it is in any case too small for a tooth of *Bison latifrons*," and thinks it "undoubtedly referable to the extinct musk-ox." Having examined the specimen in question and compared it with corresponding teeth of *Bison-bison* and the types of extinct muskox in the museum of the Academy of Natural Sciences of Philadelphia I find that this Pittston specimen is very much worn, the tritulating surface having reached to the alveolar base of the enamel on the anterior and posterior sides. The roots of the tooth are intact, and comparison with a corresponding molar removed from the jaw of an adult *Bison bison* from Utah shows that the Pittston specimen is not materially larger than the one from Utah. Owing to the wearing of these molar teeth their tritulating surface changes from an oblong, twice as long as wide, to a nearly square figure of nearly twice the tritulating area seen in the teeth of a younger adult animal of same size. Dr. Leidy's oversight of this fact was probably the reason for his identification of the tooth as that of *Bison latifrons*, to which species, it may be remarked, he had referred larger specimens of the smaller *B. antiquus*.

In this respect Dr. Allen's position is sound; the tooth is too small to belong to *latifrons*.

On the other hand it is impossible that the tooth belongs to the extinct musk-ox, the corresponding molar in that animal being nearly twice as large in the type specimens preserved in the Museum of the Academy. The accessory cusp of the molars of *Ovibos cavifrons* is even more prominent than in *Bison*, so that the lack of this cusp in the Pittston specimen as effectually removes it from one genus as from the other, and I am inclined to consider the oval median islet in the specimen as representing an abnormal displacement of the accessory cusp of the genus *Bison*. If this is granted the other characters indicate it to belong to *Bison bison*.

Of interest in this connection are the first and third lower molars of an adult bison, evidently from the same individual, which were found in the collection of the Academy. These are mounted together

¹ The American Bisons, p. 12.

on a card with the name "*Bison Americanus* DeKay, Luzerne Co., Pa." Accompanying them is a small card in Dr. Leidy's writing, which reads: "With the fossil teeth from Luzerne Co., but apparently more recent. *Bison Americanus*." I have compared these with specimens of the recent animal and find them to be specifically identical.

Waiving the question of the real status of the tooth figured by Leidy from this locality, we may safely rest the eastward extension of the habitat of *Bison bison* from Lewisburg sixty miles along the north branch of the Susquehanna on the two lower molars.

In the report of the Pennsylvania Geological Survey for 1887, Dr. Leidy, in a paper on limestone cave fossils of the State, makes the following statement in relation to certain bones found in Hartman's cave, Monroe County:—"With the remains of existing animals are those of a few species which no longer live in Pennsylvania * * * represented by a few jaw fragments and teeth of the woodland reindeer, *Rangifer caribou*, and a lower jaw fragment with the last molar tooth of the bison, *B. Americanus*." This jaw fragment and its accompanying tooth are in the collection of the Academy. They belonged to a full grown animal in its early prime. The crown of the tooth has apparently been charred and crumbled by fire in the same manner as other bones from this cave which surrounded and lay within the site of an ancient fire place in the superficial layers of the cave floor. The mandible, which is about four inches long and two inches wide and contains the alveoli of the three true molars, is unburnt and is apparently of the same recent age as the remains of the fox, wolf and deer associated therewith. I have no hesitation in considering Dr. Leidy's identification correct, and from the character of the ethnological remains found in the same cave and the appearance of the bone itself, would judge it had formed part of the feast of a Delaware Indian in comparatively recent times. This record extends the wanderings of *Bison bison* to the Delaware Valley.

There is in the Academy's collection the basal portion of a horn-core of a fossil bison taken from a closed limestone crevice in Durham cave on the bank of the Delaware near Riegelsville, Bucks County. This specimen is of evident antiquity and apparently belongs to the left side of the skull, having attached to the core a fragment of the frontal bone, two and one-half inches square. The core

portion is five inches long superiorly and presents an unbroken upper surface three inches wide at base. The greater portion of the posterior surface at the base is also intact but the anterior and inferior surfaces have been destroyed.

The greatest vertical diameter of the core may be approximated at three and one-half inches, the horizontal being slightly less. From the disposition of the deep longitudinal grooves on its uninjured surface this core was probably eight or ten inches long.

These measurements indicate an animal much larger than the largest existing bison in America and approximate the size of the smaller extinct bison, *Bison antiquus* of Leidy and Allen. A remarkable character of the Durham cave specimen is found in its curvature and the relative position to the frontal plate. The superior longitudinal profile of the core is regularly convex throughout, forming the arc of a circle whose radius is about twelve inches; the posterior profile viewed from above is slightly concave, the anterior is broken, but the direction of the grooves show it to have been convex. The superior frontal arch viewed from behind is slightly depressed from the base of core towards the median line of the skull, but at a distance of one and one-half inches it rises to a point which would touch the continued arc of the superior profile of the core. The superior base surface of the core is very flat, describing in a breadth of three inches when viewed along a line at right angles to the skull, a regular arc whose radius is six inches. The line of division between the base of core and frontal bone lacks in a remarkable degree the osseous rugosity and prominence seen in the other members of this genus. If this core belongs to the left side of the skull, it very closely resembles the style of horn seen in *Bubalus buffelus* (Blum.) in which the drop of the horn is uniformly downward and backward from base to apex, the skull and horn cores forming, when viewed from behind, a regular, obtusely parabolic arch. Should it prove, however, that the specimen belongs to the right side, the drop is a forward one. There is a suggestion of the genus *Ovibos* in the flatness and downward growth of this horn, but a comparison of it with *O. moschatus*, *O. cavifrons*, and *O. bombifrons* shows a radical difference. From *moschatus* it is at once distinguishable by its narrowness and smoothness at base of core, by its greater convexity and by the width of intercorneal diameter of frontal bones; from *cavifrons* by the lack

of any marked depression of the intercorneal plate; from *bombifrons* by its much greater size and by the flatness of horn core at superior base, which, in *bombifrons*, is highly arched as in *Bison bison*. The horn is also less abruptly depressed than in *bombifrons*, in this character being intermediate between the lop horned type of *Ovibos* and the erect type of bison, *B. patifrons* being in turn an intermediate type between the Durham cave specimen and *B. antiquus* which forms the last step toward the now existing *B. bison*, the apical portion of whose horn cores is vertical when the skull is poised at the normal facial angle of forty-five degrees. The striking peculiarities of this fossil appear to me sufficient to warrant a new specific name. I would propose *BISON APPALACHICOLUS* sp. nov., Type, No. 29, Col. Acad. Nat. Sciences, Phila., Durham Cave, near Riegelsville, Bucks Co., Pa. Postpliocene.

Regarding the question of the existence of *B. bison* in the valleys of eastern Pennsylvania since the advent of the white man in America, it is probable that it had been effectually driven from the Delaware Valley long before that date.

Indeed, from the scarcity of its remains and the absence of reliable tradition of its presence in this locality, it is unlikely that this species was ever more than a straggler in the regions east of the Susquehanna River drainage. It is not unlikely that the Carlisle cave specimens will be found to belong to the same species, as originally identified by Prof. Baird.